

WHITE RUST OF CHRYSANTHEMUM

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Florida's chrysanthemum industry, with an estimated annual value of \$30 million is concerned with the recent detection of white rust (caused by the fungus *Puccinia horiana* Henn.) in the United States.

White rust had not been found in the United States until mid-September of 1977. It was then found on one property in Pennsylvania and later in October in 14 areas in New Jersey adjacent to the original find. The disease has occurred only in hobbyist plantings [(4) and personal communication with L. B. Forer].

This disease could be more serious than *Puccinia chrysanthemi* Roze, a rust pathogen already established on chrysanthemum in the United States (5). Thus, state regulatory agencies in cooperation with the United States Department of Agriculture are making every effort to eradicate white rust from the United States.



Fig. 1. White rust pustules on leaves of chrysanthemum: A) on upper leaf surface; B) on lower leaf surface.

(Photographs courtesy of L. B. Forer and S. H. Kim, Pennsylvania Department of Agriculture).

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The rust was first described from Japan and in 1963 was introduced into Europe

(1), where it now occurs in Denmark, Austria, Norway, Sweden, England, Wales, and more recently, in Ireland (2). It has also been reported from New Zealand, Australia, Japan, China, and South Africa (5).

SYMPTOMS. Symptoms on the upper leaf surface first appear as pale, greenish yellow spots; the centers of the spots turn brown and necrotic with age (fig. 1A). On the lower surface of the leaf, prominent, pinkish buff pustules develop. They later turn waxy white, hence, the name white rust (fig. 1B). For comparison, *P. horiana* pustules are white to yellowish on the lower surface of the leaf, whereas those of *P. chrysanthemi* are chocolate brown. Conditions favorable for the development of this disease are high humidity and a film of moisture on the foliage. The spores are easily killed by drying; even by one hour at 90% relative humidity or less. The optimum temperature for disease development is between 50-77 F (10-25 C) (6).

CONTROL. When outbreaks of white rust appear, plants should be destroyed, in place if possible, by burning or by fumigation with methyl bromide. The surrounding area should be sprayed with zineb or other acceptable materials to prevent germination of existing spores.

In Europe, Fore or Manzate 200 sprays every 7-10 days or 3 applications of Plantvax at 10-day intervals have helped control this serious disease (3,7,8).

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